IN THE CLAIMS

Please amend the claims as indicated below.

What is claimed is:

1. (currently amended) A method for ~~determining~~ estimating a parameter of interest of an earth formation with a ~~logging~~ tool having a nuclear radiation source ~~for irradiating said earth formation~~ and a nuclear radiation detector spaced apart from the nuclear radiation source ~~for making measurements resulting from interaction of said irradiation with said earth formation~~, the method comprising:

(a) activating the nuclear radiation source;

~~(a)~~ (b) defining a starting time for a processing time window at which ~~said~~ measurements made by the nuclear radiation detector are responsive primarily to ~~said~~ the parameter of interest;

~~(b)~~ (c) defining an ending time for ~~said~~ the processing time window at which ~~said~~ the measurements are substantially uncontaminated by noise; and

~~(c)~~(d) analyzing ~~said~~ the measurements within ~~said~~ the processing time window for ~~determining~~ estimating the parameter of interest.

2. (currently amended) The method of claim 1 wherein defining ~~said~~ the ~~start~~ starting time further comprises determining a time at which a value of ~~said~~ the measurements has a predetermined relationship to ~~a determined~~ an estimated

value of a parameter of interest at an ending time of a processing time window for an earlier operation of said source.

3. (currently amended) The method of claim ~~2~~ 1 wherein ~~said~~ the nuclear radiation source comprises a pulsed neutron source.

4. (currently amended) The method of claim ~~2~~ 1 wherein ~~said~~ the measurements made by the nuclear radiation detector comprise gamma ray measurements.

5. (currently amended) The method of claim 3 wherein ~~said~~ the parameter of interest ~~further~~ comprises at least one of (i) a thermal neutron capture cross section of ~~said~~ the earth formation, (ii) porosity, (iii)formation water salinity, and, (iv) the quantity and type of hydrocarbons contained in pore spaces.

6. canceled

7. (currently amendedl) The method of claim 2 wherein said relationship is of the form

$$istr = K / \Sigma$$

where *istr* is the start time of a window, K is a constant, and Σ is a capture cross section at ~~said~~ the ending time of ~~said~~ the processing time window for ~~said~~ the earlier ~~pulsing~~ operation of ~~said~~ the source.

8. (currently amended) The method of claim 1 wherein defining ~~said time window ending time~~ the ending time of the processing window further comprises forming a running sum of count rates starting at ~~said~~ the starting time.

9. (currently amended) The method of claim 8 wherein defining ~~said time window ending time~~ the ending time of the processing window further comprises determining a time at which a count rate has a predetermined relation to said running sum.

10. (currently amended) The method of claim 1 further comprising partitioning ~~said~~ the processing time window into a plurality of channels (time intervals) having a length depending upon ~~said~~ the ~~start~~ starting time.

11. (currently amended) An apparatus for use within a borehole penetrating an earth formation for ~~determining~~ estimating a parameter of interest of said earth formation, comprising:

(a) a nuclear radiation source ~~for~~ irradiating ~~said~~ the earth formation;

(b) a nuclear radiation detector spaced apart from said nuclear radiation source ~~for making measurements resulting from interaction of said irradiation with said earth formation~~;

(c) a processor ~~for~~ which

(i) ~~defining~~ defines a starting time for a processing time window ~~for~~ at which ~~said~~ measurements made by the nuclear radiation detector are responsive primarily to ~~said~~ the parameter of interest; and

(ii) ~~defining~~ defines an ending time for ~~said~~ the processing time window ~~for~~ at which ~~said~~ the measurements made by the nuclear radiation detector are substantially uncontaminated by noise.

12. (currently amended) The apparatus of claim 11, wherein ~~said~~ the processor defines ~~said~~ the starting time by determining a time at which a value of ~~said~~ the measurements has a predetermined relation to a determined value of a parameter of interest at an ending time of a processing time window for an earlier operation of ~~said~~ the nuclear radiation source.

13. (currently amended) The apparatus of claim 12 wherein ~~said~~ the processor further analyzes ~~said~~ the measurements within said processing time window and determines ~~said~~ the parameter of interest.

14. (currently amended) The apparatus of claim 12, wherein ~~said~~ the nuclear radiation source further comprises a pulsed neutron source.

15. (currently amended) The apparatus of claim 14, wherein ~~said~~ the measurements made by the nuclear radiation detector ~~further~~ comprise gamma ray

measurements.

16. (currently amended) The apparatus of claim 14, wherein ~~said~~ the parameter of interest ~~further~~ comprises at least one of (i) a thermal neutron capture cross section of ~~said~~ the earth formation, (ii) porosity, (iii)formation water salinity, and, (iv) the quantity and type of hydrocarbons contained in pore spaces. [0005]

17. (currently amended) The apparatus of claim 12, wherein said predetermined relation is of the form

$$istr = K / \Sigma$$

where *istr* is the start time of a window, K is a constant, and $\Sigma$is a capture cross section at ~~said~~ the ending time of ~~said~~ the processing time window for ~~said~~ the earlier ~~pulsing~~ operation of ~~said~~ the nuclear radiation source.

18. (currently amended) The apparatus of claim 11 wherein ~~said~~ the processor defines ~~said~~ the ending time based on forming a running sum of count rates starting at ~~said~~ the starting time.

19. (original) The apparatus of claim 18, wherein processor defines said ending based on forming a running sum of count rates starting at said starting time.

20. (original) The method of claim 19, wherein said processor defines said ending

time based on determining a time at which a count rate has a predetermined relation to said running sum.

21. (currently amended) A system for estimating ~~determining~~ a parameter of interest from an earth formation, comprising:

(a) a ~~logging~~ tool including:

(i) a nuclear radiation source ~~for irradiating said earth formation~~,

(ii) at least one nuclear radiation detector spaced apart from said nuclear radiation source ~~for making measurements resulting from interaction of said irradiation with said earth formation~~;

(b) a ~~processing unit~~ processor ~~for~~ defining a starting time and an ending time ~~for~~ of a time window ~~of~~ for analysis of ~~said~~ measurements made by the nuclear radiation detector, wherein said measurements are responsive primarily to said parameter of interest at said starting time and are substantially uncontaminated by noise at said ending time.

22. (original) The system of claim 21, wherein said processor defines said start time based on a a time at which a value of said measurements have a predetermined relation to a determined value of a parameter of interest at an ending time of a processing time window for an earlier operation of said source.

23. (currently amended) The system of claim ~~22~~ 21, wherein ~~said~~ the nuclear radiation

source further comprises a pulsed neutron source.

24. (currently amended) The system of claim ~~22~~ 21, wherein said measurements made by the nuclear radiation detector further comprise gamma ray measurements.

25. (currently amended) The system of claim 22, wherein ~~said~~ the parameter of interest ~~further~~ comprises at least one of (i) a thermal neutron capture cross section of ~~said~~ the earth formation, (ii) porosity, (iii)formation water salinity, and, (iv) the quantity and type of hydrocarbons contained in pore spaces.

26. (currently amended) The system of claim 22, wherein said predetermined relation is of the form

$$istr = K / \Sigma$$

where *istr* is the start time of a window, K is a constant, and Σ is a capture cross section at ~~said~~ the ending time of ~~said~~ the processing time window for said earlier ~~pulsing~~ operation of said source.

27. (original) The system of claim 21, wherein said processor determines said ending time based on forming a running sum of count rates starting at said starting time.

28. (original) The system of claim 27, wherein said processor determines said ending time based on determining a time at which a count rate has a predetermined

relation to said running sum.

29. (new) The system of claim 21 further comprising a conveyance device which conveys the tool into a borehole in the earth formation.

30. (new) The system of claim 21 wherein the conveyance device is one of (i) a wireline, (ii) coiled tubing.

31. (new) The system of claim 21 further comprising a channel number generator which produces a numerical sequence of memory address codes corresponding to a sequence of adjacent time windows.

32. (new) The system of claim 21 further comprising a mass storage unit associated with the processor.

33. (new) The system of claim 31 further comprising a spectrum accumulator.

34. (new) The system of claim 30 wherein the conveyance device comprises a wireline, the system further comprising a depth controller which provides signals indicative of a depth of said tool.